

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| | | |
|--|---|--|
| Applicant's or agent's file reference 40666 | FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below. | |
| International application No. PCT/IL 00/ 00820 | International filing date (day/month/year) 05/12/2000 | (Earliest) Priority Date (day/month/year) 05/12/1999 |
| Applicant ORBOTECH LTD. | | |

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.
☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1
☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/IL 00/00820

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G01N21/956

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G01N G01R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, INSPEC, PAJ, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|--|
| X | US 4 830 497 A (IWATA SATOSHI ET AL) 16 May 1989 (1989-05-16) | 1-5, 7, 19-23, 35-38, 59 43, 50, 60 |
| A | abstract column 2, line 16 - line 44 column 4, line 50 - line 62 column 9, line 17 - line 30 figures 3, 19 | |
| A | US 4 893 346 A (BISHOP ROBERT) 9 January 1990 (1990-01-09) | 1-7, 19, 35, 43-46, 50-53 |
| | abstract column 7, line 34 - line 53 column 8, line 21 - line 60 column 10, line 15 - line 54 figures 2, 8 | |

-/--

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

Date of the actual completion of the international search

21 December 2001

Date of mailing of the international search report

07/01/2002

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl.
Fax: (+31-70) 340-3016

Authorized officer

Verdoordt, E

INTERNATIONAL SEARCH REPORT

Internat. Application No

PCT/IL 00/00820

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|--|-----------------------|
| A | US 4 648 053 A (FRIDGE DAVID A) 3 March 1987 (1987-03-03) the whole document | 1,7,19, 35,43,50 |
| A | US 4 481 664 A (LINGER CLAUDE J A ET AL) 6 November 1984 (1984-11-06) the whole document | 1,7,19, 35,43,50 |
| A | US 5 495 535 A (HAREL EYAL ET AL) 27 February 1996 (1996-02-27) cited in the application the whole document | 1,7,19, 35,43,50 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No.

PCT/IL 00/00820

| Patent document cited in search report | | Publication date | Patent family member(s) | Publication date |
|---|---|---------------------|----------------------------|---------------------|
| US 4830497 | A | 16-05-1989 | JP 1737860 C | 26-02-1993 |
| | | | JP 4026684 B | 08-05-1992 |
| | | | JP 62263404 A | 16-11-1987 |
| | | | JP 1749292 C | 08-04-1993 |
| | | | JP 4035684 B | 11-06-1992 |
| | | | JP 62299710 A | 26-12-1987 |
| | | | DE 3786699 D1 | 02-09-1993 |
| | | | DE 3786699 T2 | 11-11-1993 |
| | | | EP 0246145 A2 | 19-11-1987 |
| US 4893346 | A | 09-01-1990 | CA 1252216 A1 | 04-04-1989 |
| | | | CN 86100704 A , B | 10-09-1986 |
| | | | DE 3587582 D1 | 21-10-1993 |
| | | | EP 0195161 A2 | 24-09-1986 |
| US 4648053 | A | 03-03-1987 | NONE | |
| US 4481664 | A | 06-11-1984 | EP 0054596 A1 | 30-06-1982 |
| | | | DE 3070721 D1 | 04-07-1985 |
| | | | JP 1275586 C | 31-07-1985 |
| | | | JP 57107046 A | 03-07-1982 |
| | | | JP 59051135 B | 12-12-1984 |
| US 5495535 | A | 27-02-1996 | IL 100824 A | 05-12-1996 |
| | | | DE 69326920 D1 | 09-12-1999 |
| | | | DE 69326920 T2 | 20-04-2000 |
| | | | EP 0578816 A1 | 19-01-1994 |
| | | | JP 7504978 T | 01-06-1995 |
| | | | WO 9315474 A1 | 05-08-1993 |

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

NOTIFICATION OF RECEIPT
OF DEMAND BY COMPETENT INTERNATIONAL
PRELIMINARY EXAMINING AUTHORITY

(PCT Rules 59.3(e) and 61.1(b), first sentence
and Administrative Instructions, Section 601(a))

To:
MICHAEL L. LEVINE
STOEL RIVES LLP
900 SW FIFTH AVENUE
SUITE 2600
PORTLAND, OR 97204

Date of mailing
(day/month/year)

07 FEB 2001

Applicant's or agent's file reference
17420/4:1

IMPORTANT NOTIFICATION

International application No.
PCT/US00/12335

International filing date (day/month/year)
04 MAY 00

Priority date (day/month/year)
05 MAY 99

Applicant
LUCIDYNE TECHNOLOGIES, INC.

1. The applicant is hereby notified that this International Preliminary Examining Authority considers the following date as the date of receipt of the demand for international preliminary examination of the international application:

04 October 2000 (04-10-00)

2. That date of receipt is:

- ☒ the actual date of receipt of the demand by this Authority (Rule 61.1(b)).
- ☐ the actual date of receipt of the demand on behalf of this Authority (Rule 59.3(e)).
- ☐ the date on which this Authority has, in response to the invitation to correct defects in the demand (Form PCT/IPEA/404), received the required corrections.

3. ☐ **ATTENTION:** That date of receipt is **AFTER** the expiration of 19 months from the priority date. Consequently, the election(s) made in the demand does (do) not have the effect of postponing the entry into the national phase until 30 months from the priority date (or later in some Offices) (Article 39(1)). Therefore, the acts for entry into the national phase must be performed within 20 months from the priority date (or later in some Offices) (Article 22). For details, see the *PCT Applicant's Guide, Volume II*.

- ☐ (If applicable) This notification confirms the information given by telephone, facsimile transmission or in person on:

4. Only where paragraph 3 applies, a copy of this notification has been sent to the International Bureau.

Name and mailing address of the IPEA/
Assistant Commissioner for Patent
Box PCT
Washington, D.C. 20231 Attn:RO/US
Facsimile No. 703-305-3230

Authorized officer

Telephone No.

M. J. J.
703. 305-6454

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

To: MICHAEL L. LEVINE
STOEL RIVES LLP
900 SW FIFTH AVENUE
SUITE 2600
PORTLAND OR 97204

PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL SEARCH REPORT OR THE DECLARATION

(PCT Rule 44.1)

Date of Mailing
(day/month/year) **11 SEP 2000**

Applicant's or agent's file reference
17420/4:1

FOR FURTHER ACTION See paragraphs 1 and 4 below

International application No.
PCT/US00/12335

International filing date
(day/month/year) 04 MAY 2000

Applicant
LUCIDYNE TECHNOLOGIES, INC.

1. ☒ The applicant is hereby notified that the international search report has been established and is transmitted herewith.

Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report; however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

- ☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.
☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in rules 90 *bis* 1 and 90 *bis* 3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

MICHAEL P. STAFFRA

Telephone No. (703) 308-4837

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| | | |
|--|---|--|
| Applicant's or agent's file reference 17420/4:1 | FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below. | |
| International application No. PCT/US00/12335 | International filing date (day/month/year) 04 MAY 2000 | (Earliest) Priority Date (day/month/year) 05 MAY 1999 |
| Applicant LUCIDYNE TECHNOLOGIES, INC. | | |

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the
- ☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (See Box II).

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant.
- ☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☐ the text is approved as submitted by the applicant.
- ☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 1

- ☒ as suggested by the applicant.
- ☐ because the applicant failed to suggest a figure.
- ☐ because this figure better characterizes the invention.

☐ None of the figures.

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

The abstract is too long (PCT Rule 8.1(b)). The abstract must be less than 150 words, or 200 words when no Figure is to be published.

NEW ABSTRACT

The present invention employs a blinded fiber-optic light illumination system (12) to illuminate a wood board (24) with a sharp projected light edge to detect the tracheid, color, and geometric characteristics of the lumber during an automated grading process. The light line (70) employs thousands of fibers (46) of desired length (58) and thickness (52). The fiber (46) are randomized such that fibers (46) neighboring each other in the cable (48) do not necessarily neighbor each other in the light line subunit (42) so that the emitted light has substantially uniform intensity over its spatial range. Multiple light line subunit (42) are positioned adjacent to one other to achieve a desired light line length (60). A set of image sensors (22) in predetermined positions obtain three types of data from the light incident to the board (24). A computer analyzes the data to interpret the physical characteristics of the board (24) and determine how to grade or cut it.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/12335

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) :G01N 21/00

US CL :356/237.1, 237.2

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 356/237.1, 237.2

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONEElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
USPTO EAST**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|--|-----------------------|
| A | US 5,644,392 A (Soest et al.) 01 July 1997 (01.07.1997), see entire document. | 1-15 |

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

| | |
|---|--|
| * Special categories of cited documents: | "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention |
| "A" document defining the general state of the art which is not considered to be of particular relevance | "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone |
| "E" earlier document published on or after the international filing date | "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art |
| "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) | "&" document member of the same patent family |
| "O" document referring to an oral disclosure, use, exhibition or other means | |
| "P" document published prior to the international filing date but later than the priority date claimed | |

Date of the actual completion of the international search

26 JUNE 2000

Date of mailing of the international search report

11 SEP 2000

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231

Facsimile No. (703) 305-3230

Authorized officer

MICHAEL P. SYAFIRA

Telephone No. (703) 308-4837

NOTES TO FORM PCT/ISA/220 (continued)

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers;
claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under Article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

The statement should be brief, it should not exceed 500 words if in English or if translated into English.

It should not be confounded with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It should not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

In what language ?

The amendments must be made in the language in which the international application is published. The letter and any statement accompanying the amendments must be in the same language as the international application if that language is English or French; otherwise, it must be in English or French, at the choice of the applicant.

Consequence if a demand for international preliminary examination has already been filed ?

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase ?

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:
MICHAEL L. LEVINE
STOEL RIVES LLP
900 SW FIFTH AVENUE
SUITE 2600
PORTLAND, OR 97204

PCT

NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

| | | | |
|---------------------------------------|--|-------------------------------------|-------------|
| | | Date of Mailing (day/month/year) | 19 MAR 2001 |
| Applicant's or agent's file reference | | IMPORTANT NOTIFICATION | |
| 17420/4:2 | | | |
| International application No. | International filing date (day/month/year) | Priority date (day/month/year) | |
| PCT/US00/12335 | 04 May 2000 (04.05.2000) | 05 May 1999 (05.05.1999) | |
| Applicant | | | |
| Lucidyne Technologies, Inc. | | | |

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

| | |
|---|--|
| Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230 | Authorized officer Frank Font Telephone No. 703-308-0956 |
|---|--|

REC'D 22 MAR 2001

WIPC

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

| | | |
|--|---|--|
| Applicant's or agent's file reference 17420/4:2 | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) | |
| International application No. PCT/US00/12335 | International filing date (day/month/year) 04 May 2000 (04.05.2000) | Priority date (day/month/year) 05 May 1999 (05.05.1999) |
| International Patent Classification (IPC) or national classification and IPC IPC(7): G01N 21/00 and US Cl.: 356/239.1 | | |
| Applicant Lucidyne Technologies, Inc. | | |

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

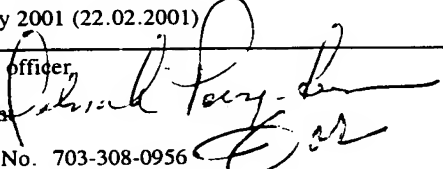
2. This REPORT consists of a total of 3 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 0 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of report with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☐ Certain observations on the international application

| | |
|---|---|
| Date of submission of the demand 04 October 2000 | Date of completion of this report 22 February 2001 (22.02.2001) |
| Name and mailing address of the IPEA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703)305-3230 | Authorized officer, Frank For  Telephone No. 703-308-0956 |

I. Basis of the report**1. With regard to the elements of the international application:***

- ☒ the international application as originally filed.
- ☒ the description:
pages 1-10 as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.
- ☒ the claims:
pages 11-13, as originally filed
pages NONE, as amended (together with any statement) under Article 19
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.
- ☒ the drawings:
pages 1-6, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.
- ☐ the sequence listing part of the description:
pages NONE, as originally filed
pages NONE, filed with the demand
pages NONE, filed with the letter of _____.

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language _____ which is:

- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in printed form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages NONE
- ☐ the claims, Nos. NONE
- ☐ the drawings, sheets/fig NONE

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International Application No.

PCT/US00/12335

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. STATEMENT

| | | |
|-------------------------------|--------------------|-----|
| Novelty (N) | Claims <u>1-15</u> | YES |
| | Claims <u>NONE</u> | NO |
| Inventive Step (IS) | Claims <u>1-15</u> | YES |
| | Claims <u>NONE</u> | NO |
| Industrial Applicability (IA) | Claims <u>1-15</u> | YES |
| | Claims <u>NONE</u> | NO |

2. CITATIONS AND EXPLANATIONS (Rule 70.7)

Claims 1-15 meet the criteria set out in PCT Article 33(2)-(4), because the prior art does not teach or fairly suggest a illumination system wherein the light input array includes light input ends closely packed elongate optical fibers, the optical fibers having a cross-sectional dimension, and the input array having an array surface dimension greater than the fiber cross-sectional dimension.

----- NEW CITATIONS -----

DECISION OF THE INTELLECTUAL PROPERTY OFFICE
(TRANSLATION)

Date of Issuance: 22 September 2001

1. Application No.: 088121440
International Classification: G06K 5/00
2. Title: ADAPTIVE TOLERANCE REFERENCE INSPECTION SYSTEM
3. Applicant:
Address: Israel
4. Attorney: C. V. Chen
Address: 7th Floor, No. 201, Tun Hua North Road, Taipei
5. Filing Date: 6 December 1999
6. Priority Claim: None
7. Examiner: Mr. Chuan-Jui Wu
8. Contents of Decision:

SUBJECT: The subject matter shall not be granted a patent.

BASIS: Paragraph 2 of Article 20 of the Patent Law.

REASONS:

- (1) The adaptive tolerance reference inspection system of the subject invention relates to a system, which comprises a tolerance indicator and a fault detection circuitry, for inspecting electrical circuits. The tolerance indicator provides a tolerance output and the fault detection circuitry provides an output indication of faults in the electrical circuit in response to the tolerance output.
- (2) It is found that ROC (Taiwan) Patent Publication No. 139,547, which was published on 11 August 1990 in the ROC (Taiwan) Patent Gazette (see the Attachment) and entitled "APPARATUS FOR DETECTING

MALFUNCTIONS OF AN ELECTRICAL DEVICE," comprises inductive means, comparator means, detecting means, timing means, and indicating means, wherein said detecting means being adapted to provide a signal to said indicating means when it receives default and timing signals.

- (3) The subject invention utilizes tolerance output to indicate an output indication of faults. The cited patent utilizes comparator means for comparing to a predetermined reference value, and said comparator means includes adjustment means, i.e. it also has a function of tolerance, and said indicating means can also indicate faults. Thus, the subject invention utilizes conventional technology known prior to applying for patent, which can be accomplished easily by persons skilled in the art. Therefore, the subject application does not have an inventive step.

In view of the above, the application does not conform to the provisions of Paragraph 2 of Article 20 of the Patent Law and patent rights are not granted thereto.

Sealed By

Chen, Ming-Bang
Commissioner

Note: If dissatisfied with the Decision, the Applicant may file a request for re-examination within 30 days following the date of receipt of this Decision.

77107-285

ZMJ-100/101-A

APPARATUS FOR DETECTING
MALFUNCTIONS OF AN ELECTRICAL DEVICE

5 The invention relates to apparatus for detecting malfunctions of an electrical device, and particularly to a circuit for detecting when an electrical device loses current.

The phrase "loss of current" applies not only to a literal loss of current, but also a reduction in current below a predetermined normal or minimum current value.

10 Figs. 1-3 show a power capacitor assembly equipped with indicator lights and detecting apparatus according to the invention.

Fig. 4 is a circuit diagram of a first embodiment of detecting apparatus.

15 Fig. 5 is an enlarged view of a sensing loop portion of the detecting apparatus.

Fig. 6a is a circuit diagram of a second embodiment of the detecting apparatus.

20 Fig. 6b is a circuit diagram of a power supply for the Fig. 6a circuit.

Fig. 7 is a block diagram of the Figs. 6a and 6b circuits.

Fig. 8 is a block diagram of the circuit shown in Fig. 4.

Fig. 9 is a block diagram of the Fig. 10 embodiment.

25 Fig. 10 is a circuit diagram of a third embodiment of a detecting apparatus.

Fig. 11 is a circuit diagram of a fourth embodiment of a detecting apparatus.

Fig. 12 is a circuit diagram of a power supply which can be used with Fig. 10 or 11.

30 Figs. 13 and 14 are different resistor networks which can be used with Fig. 10.

2

Figs. 1-3 show power capacitor assembly 1 equipped with fuses 2 and indicator lights 4 (such as CAL-LITE devices) and indicator light 6. Assembly 1 includes pressure-actuated interrupter 8.

5 Fig. 1 represents the assembly during normal working conditions, including occasional occurrence of faults which are self-cleared by the assembly. Normally occurring faults are not sufficiently strong to blow the fuses.

10 Fig. 2 shows the assembly after a severe voltage spike which punctures the capacitor substrate of a foil/paper/film type capacitor, but the capacitor clears and recovers with only a minuscule loss of capacitance. Fuses 2 are sensitive to the spikes and may blow. The actuated light 4 warns maintenance personnel that fuse 2 should be replaced.

15 Fig. 3 represents the assembly after interrupter 8 has opened due to excessive pressure being built up within the assembly from many self-clearings of the metallized capacitor. Assembly 1 has ended its useful life and is taken off line by interrupter 8, resulting in an open circuit. Lights 4 are not
20 actuated because there is no longer any current flowing through the line. Indicator 6 is actuated because it responds to loss of current in the capacitor. Maintenance personnel can quickly recognize that assembly 1 has failed, and replace it with a new assembly.

25 Indicator 6 is in series with assembly 1 and fuse 2.

Indicator 6 is actuated if associated fuse 2 is blown by a severe voltage spike, because there would be a loss of current in the line.

30 Maintenance personnel are made aware of a problem by indicator 6.

The Fig. 4 circuit includes current transformer 10, bridge rectifier 12, capacitor 14, current-sensitive switching device

16, indicator means 18, a pair of resistors 20, and contacts 22 connected to a voltage supply.

Transformer 10 is preferably miniature.

Fig. 5 transformer core 24 has an opening or window formed therein, and a primary 26 of the transformer extends into the opening. Primary 26 functions as a sensing loop for an electrical device being monitored, and is placed in series with the device. The number of turns of primary 26 is selected depending on the current load of the device (see Table I below).

A given voltage level is required to keep device 16 switched on during normal operation of the device, and the number of turns of primary 26 is selected to establish the given voltage based on the current load of the device.

TABLE I

| | <u>Nominal current (amps)</u> | <u>Turns of Primary*</u> |
|----|-------------------------------|--------------------------|
| | 18.0 | 1/2 |
| 20 | 16.8 | 1/2 |
| | 15.6 | 1/2 |
| | 14.4 | 1/2 |
| 25 | 12.0 | 1 |
| | 9.6 | 1 |
| | 8.4 | 1 |
| 30 | 7.2 | 1 |
| | 6.0 | 1.5 |
| | 4.8 | 2 |
| 35 | 3.6 | 2.5 |

2.4

3

5 * Power input at contacts 22 = 240v A.C.; resistors 20 = 68k ohms, 1 watt 600v rated.

10 Although Table I indicates primary 26 as having 1/2-3 turns, primary 26 could have any number of turns depending on current load, different power inputs at the contacts 22, and different value resistors 20.

 A secondary 28 of transformer 10 is wound around core 24 and is connected to rectifier 12. The number of turns of secondary 28 is preferably in the range of 500-2000, but can be chosen to be any desired number.

15 Device 16 permits means 18 to be actuated by the AC input at contacts 22 when there is a loss of current in the monitored device. Preferably, device 16 may be a sensitive gate triac which can be turned on or kept on by very low currents.

20 Means 18 can be any type of indicator, e.g., a light, an audio alarm, a combination of audio and visual indicators, etc. To use a combination of indicators, a preferred arrangement would be to place a first indicator (light) at 18 in Fig. 4, and then connect a high sensitivity relay in parallel with the first indicator, the relay actuating a second indicator (siren or bell)
25 in unison with the first indicator. The relay would have a pair of high current switching contacts (30 in Fig. 8) connected to the second indicator.

30 Resistors 20 preferably have the same value, which is selected in dependence on the power input at contacts 22. It is possible to use only one of resistors 20, but it is preferable to use two for safety purposes.

 In Fig. 6a current transformer 110 and bridge rectifier 112 have substantially the same structure as transformer 10 and rectifier 12 of Fig. 4. The circuit includes inverter means,

including transistors 132, 134, resistors 136-146, and input terminal 148 for a low voltage DC power supply. The inverter means has a straight output to a first indicator portion of the circuit, including indicator light 118, and an inverted output
5 to a second indicator portion, which includes output contacts 182. The first indicator portion is similar to device 16 and indicator means of Fig. 4, except that it includes resistor 152 before current-sensitive switching device 116, and transistor 120 associated with power input contacts 122.

10 An opto-isolator 150 is a safety device, and establishes a zero crossing to stop electromotive induction.

The second indicator portion includes a second current-sensitive switching device 160, variable resistor 162, resistors 164, 166, and contacts 182. Contacts 182 may be connected to a
15 second indicator, such as a siren or bell. Resistor 166 prevents false triggering of device 160. Resistor 162 could be replaced by other components, such as a resistor and capacitor in series.

A second opto-isolator 168 is placed between the inverter means and the second indicator portion.

20 Although the second indicator portion is shown as a solidstate relay, it could be replaced by any switching device. For example, the second indicator portion could be a magnetic relay. In this event, the low voltage DC supply of Fig. 6b would have to be connected to the magnetic relay also (dotted line 184
25 in Fig. 7).

Fig. 6b shows a circuit diagram for a low voltage DC power supply for the inverter means, and possibly also the magnetic relay portion of the Fig. 6a circuit. The circuit includes current transformer 210, bridge rectifier 212, capacitors 214-
30 218, voltage regulator 220, and contacts 222.

Fig. 11 shows main circuit 1' including current transformer 2', input signal conditioner 3', a plurality of window gates 4', 6', 8', combining logic member 10', timer logic member 12', timer

trigger 14', timer 16', detector logic members 18', 20', and indicator means 22'.

Transformer 2' is connected to a group of electrical devices and provides an input signal to the rest of circuit 1' indicative of electrical energy in the devices. Transformer 2' can be connected to the devices by using a common input line of the devices as the primary winding for transformer 2'.

Conditioner 3' may include bridge rectifier 24', resistor 26', and a pair of capacitors 28', 30'.

Collectively, gates 4', 6', 8' and member 10' function as a comparator means. Each gate 4', 6', 8' receives a conditioned input signal from conditioner 3' and compares it to one or more predetermined ranges of reference values. Each gate 4', 6' would compare the signal to two appropriate ranges of reference values, while gate 8' would compare the signal to a single range of reference values.

The ranges of values used by gates 4', 6' are preferably set using a resistor network, such as network 80' of Fig. 13 or network 90' of Fig. 14, having terminals connected to terminals 31'-38' of gates 4', 6'. The range of values used by gate 8' is preferably set using resistors 39'-41'. The range of reference values for gate 8' could also be set using resistor network 80' or 90', while any other reference setting means could be used in place of network 80' or 90' and resistors 39'-41'.

If the conditioned input signal falls outside of any of the reference ranges of gates 4', 6', 8', the corresponding gate(s) will send an initial default signal to member 10'. Member 10', which functions as a multiple OR gate, will send a final default signal to member 12' if it receives initial default signals corresponding to initial signals outside of all of the reference ranges of gates 4', 6', 8'. As long as the input signal falls within one of the reference value ranges, member 10' will not output a final default signal to member 12'.

Each of the reference ranges of gates 4', 6', 8' is predetermined to correspond to an electrical energy level that would be normally encountered when a different, given number and type of electrical devices is turned on. The reference range of gate 8' could be set to a low value such as normally encountered when none of the electrical devices is turned on, whereby gate 8' would be a zero current gate, and the four reference ranges of gates 4', 6', could progressively correspond to electrical energy levels that would be normally encountered when one, two, three and four electrical devices are turned on, respectively.

Alternatively, gate 8' could be used as a zero current gate, while each of the reference ranges in gates 4', 6', could correspond to an electrical energy level that would be normally encountered when a different, whole group of electrical devices was turned on. Circuit 1' may monitor several groups of devices, each group forming a step in a large bank of devices which can be selectively and/or progressively turned on as required.

It is possible to have a separate inductive means associated with each electrical device individually or with each step/group of devices in a large switched bank, and to have an input signal from each such inductive means sent to a separate window gate.

A modification to circuit 1' could use only one window gate in combination with a means for automatically setting or adjusting the reference range of the gate in dependence on which of the devices in a group are turned on. Such setting means could comprise a pair of variable resistors (one for the upper range limit and the other for the lower range limit), and contactors each individually associated with one of the devices and which would change the upper and lower limits of the resistors when the devices are turned on or off.

An appropriate window gate is a LM339 chip. An appropriate member 10' is a 4048 chip.

When member 10' outputs a final default signal, it is sent to the timing means which comprises member 12', trigger 14' and timer 16'. Trigger 14' (effectively an oscillator) provides a continuous output to member 12'. Member 12' functions as an AND gate such that when it receives a final default signal from member 10' simultaneously with the output signal from trigger 14' it sends a start signal to 16' which sends a timer signal to member 20' after a predetermined time period.

Member 12' also forwards the final default signal from member 10' to member 18', which is a hex inverter buffer. Member 18' sends the final default signal to member 20'. Member 20' functions as an AND gate such that when it simultaneously receives the default signal from member 18' and the timer signal from timer 16' it sends an enable signal to means 22'. Members 18', 20' collectively comprise a detector means.

It is possible to simplify the timer and detector means by providing the final default signal directly from member 10' to timer 16' (so that the default signal functions as a start signal) and to member 20'.

A preferred member 12' is a Schmitt trigger, such as a 4093 chip, because it provides high accuracy with respect to the start signal sent to timer 16' and the default signal forwarded to member 18'. A preferred trigger 14' is a 555 chip. A preferred timer is a 556 chip. A preferred member 18' is a 4001 chip. Member 20' is preferably a 4091 chip.

Resistor 42' and capacitors 43', 44' ensure the integrity of the start signal sent from member 12' to timer 16'. Resistor 46' and capacitor 47' function as a filter to prevent any power surges from improperly enabling means 22'.

Between member 20' and means 22' there are optionally provided latching relay 48', such as a 2N5060 SCR, and reset switch 50'. Relay 48' ensures that if one of the electrical devices malfunctions for the predetermined time period set by

timer 16', then means 22' cannot be de-actuated even if the malfunctioning devices stops malfunctioning.

Switch 50' permits an operator observing means 22' in an enabled state to reset circuit 1' and determine if any of the devices are malfunctioning by observing if means 22' is re-enabled after the predetermined time period.

Means 22' can include LED 52' as an indicator light and a high sensitivity relay 54' having output terminals 56', 57' connected to an audible alarm, a computer control system, etc.

Fig. 12 shows a circuit 70' of an appropriate power supply, such as a low voltage DC power supply for circuit 1' of Fig. 10. Circuit 70' includes input terminals 71', 72' connected to an appropriate power source, transformer 73', bridge rectifier 74', and regulator 75'. Output terminals 76', 77' of circuit 70' are connected to members 4'-22' at input terminals 101'-117'.

Fig. 11 shows circuit 201' wherein inductive means 202', input signal conditioner 203', and indicator means 222' are identical to corresponding components of circuit 1'.

The timer means and detector means of circuit 201' are substantially similar to the corresponding components of circuit 1' except that first detector logic member 218' is directly connected to the comparator means for receiving a default signal therefrom and passes the default signal to timer logic member 212', whereas in circuit 1' the member 12' is directly connected to the comparator means for receiving the default signal therefrom and passes it on to member 18'.

Member 212' functions as an AND gate and sends a start signal to timer 216'. A preferred member 212' is a 4023 chip.

In circuit 201' the comparator means comprises multilevel gate 204', level selector switch 206', and reference value means including resistors 230'-232' and switches 233', 234'. Gate 204' is preferably an LM3914 comparator chip. Gate 204' divides a conditioned input signal from conditioner 203' into a number of

equal steps, each relating to a different energy level of a group of electrical devices being monitored, and each step appears as a separate output from gate 204'. Depending on the setting of switch 206' a selected one of the stepped outputs from gate 204' is compared to a predetermined reference value, established by the reference value setting means. The value of the setting means is variable depending on the position of switches 233', 234'.

When the energy level of the selected stepped output exceeds the reference value, a default signal is not sent through switch 206' to the detector and timer means. When the energy level of the selected stepped output falls below the reference value, a default signal is passed to the detector and timer means. The comparator means of circuit 201' can monitor different groups of electrical devices by setting appropriate positions of switches 206', 233', 234'.

Circuit 201' could also be used to monitor different, individual electrical devices, as well as different groups of electrical devices.

11

CLAIMS

- 1 -

1 Apparatus for detecting malfunctions of an electrical
2 device, comprising:
3 a current transformer in series with said electrical
4 device;
5 a current-sensitive switching means connected to said
6 transformer;
7 indicating means connected to said switching means; and
8 a power supply; and
9 said switching means being adapted to actuate said
10 indicating means when said electrical device loses current.

- 2 -

1 Apparatus for detecting malfunctions of an electrical
2 device, comprising:
3 a current transformer in series with said electrical
4 device;
5 inverter means connected to said transformer;
6 a current-sensitive switching means connected to said
7 inverter means;
8 indicating means connected to said switching means; and
9 at least one power supply;
10 said indicator means including first and second indicators;
11 and
12 said switching means being adapted to actuate said
13 indicating means when said electrical device loses current.

- 3 -

1 Apparatus according to claim 1 or 2, wherein:
2 a primary of said transformer is connected in series with
3 said electrical device.

12

- 4 -

1 Apparatus for detecting malfunctions of a single electrical
2 device in a group of electrical devices, comprising:

3 inductive means connected to a group of electrical devices
4 and providing an input signal corresponding to electrical energy
5 in said group;

6 comparator means connected to said inductive means for
7 receiving said input signal and for providing a default signal
8 when at least one of said devices malfunctions;

9 detector means connected to said comparator means and
10 receiving said default signal;

11 timer means connected to said comparator and detector
12 means, and being actuated upon receiving said default signal and
13 providing a timer signal to said detector means a predetermined
14 time thereafter; and

15 indicator means connected to said detector means and
16 receiving and enable signal therefrom;

17 said detector means being adapted to provide said enable
18 signal to said indicator means only if it receives said default
19 and timer signals simultaneously.

- 5 -

1 Apparatus according to claim 4, wherein:

2 said inductive means is connected to a common output of said
3 group of electrical devices.

- 6 -

1 Apparatus according to claim 4, wherein:

2 said comparator means comprises a multi-level gate and a
3 level selector switch;

4 said gate dividing said input signal into a plurality of
5 stepped outputs relating to different energy levels; and

13

6 said switch permitting any one of said stepped outputs to
7 be selectively connected to said detector and timer means.

- 7 -

1 Apparatus for detecting malfunctions of an electrical
2 device, comprising:

3 inductive means connected to an electrical device and
4 providing an input signal corresponding to electrical energy in
5 said device;

6 comparator means connected to said inductive means for
7 receiving said input signal, for comparing a value of said input
8 signal to a predetermined reference value, and for outputting and
9 default signal when said input signal value is less than said
10 reference value; and

11 said comparator means including adjustment means which can
12 be set to numerous positions to adapt said apparatus to
13 selectively monitor different electrical devices which normally
14 operate at different energy levels.

- 8 -

1 Apparatus for detecting malfunctions of an electrical
2 device, comprising:

3 inductive means connected to an electrical device and
4 providing an input signal indicative of electrical energy in
5 said device;

6 switching means connected to said inductive means and
7 receiving said input signal therefrom;

8 a power supply connected to said switching means; and

9 indicating means connected between said switching means and
10 said power supply;

11 said switching means being adapted to be switched on and
12 prevent said indicating means from being actuated by said power
13 supply while the electrical energy in said device is greater than

14

14 or equal to a predetermined level, and said switching means being
15 adapted to be switched off and permit the indicating means to be
16 actuated by said power supply while the electrical energy in said
17 device is less than said predetermined level.

- 9 -

1 Apparatus for detecting malfunctions of an electrical
2 device, comprising:

3 inductive means connected to an electrical device and
4 providing an input signal indicative of electrical energy in said
5 device;

6 inverter means connected to said inductive means and
7 receiving said input signal therefrom;

8 switching means connected to said inverter means;

9 a power supply connected to said inverter means and said
10 switching means; and

11 indicating means connected between said switching means and
12 said power supply;

13 said switching means being adapted to be switched on and
14 prevent said indicating means from being actuated by said power
15 supply while the electrical energy in said device is greater than
16 or equal to a predetermined level, and said switching means being
17 adapted to be switched off and permit the indicating means to be
18 actuated by said power supply while the electrical energy in said
19 device is less than said predetermined level.

ABSTRACT

Apparatus for detecting malfunctions of an electrical device comprises a current transformer connected to an electrical
5 device, a current-sensitive switch connected to the transformer,
a power supply connected to the switch, an indicator connected
between the switch and the power supply. The switch prevents the
indicator from being actuated when the energy in the device is
equal to or greater than a certain level, and permits the
10 indicator to be actuated when the energy in the device is less
than that level.

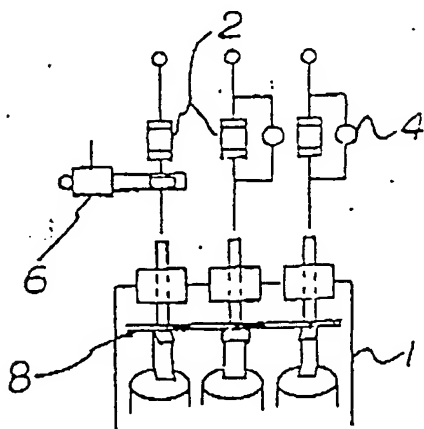


Fig. 1

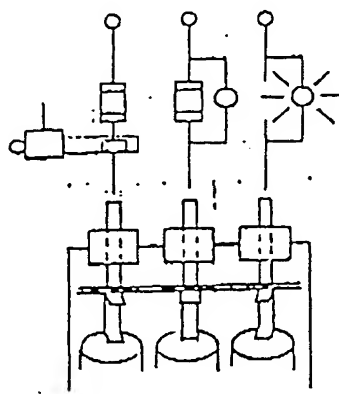


Fig. 2

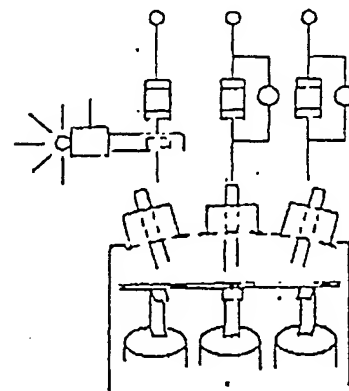


Fig. 3

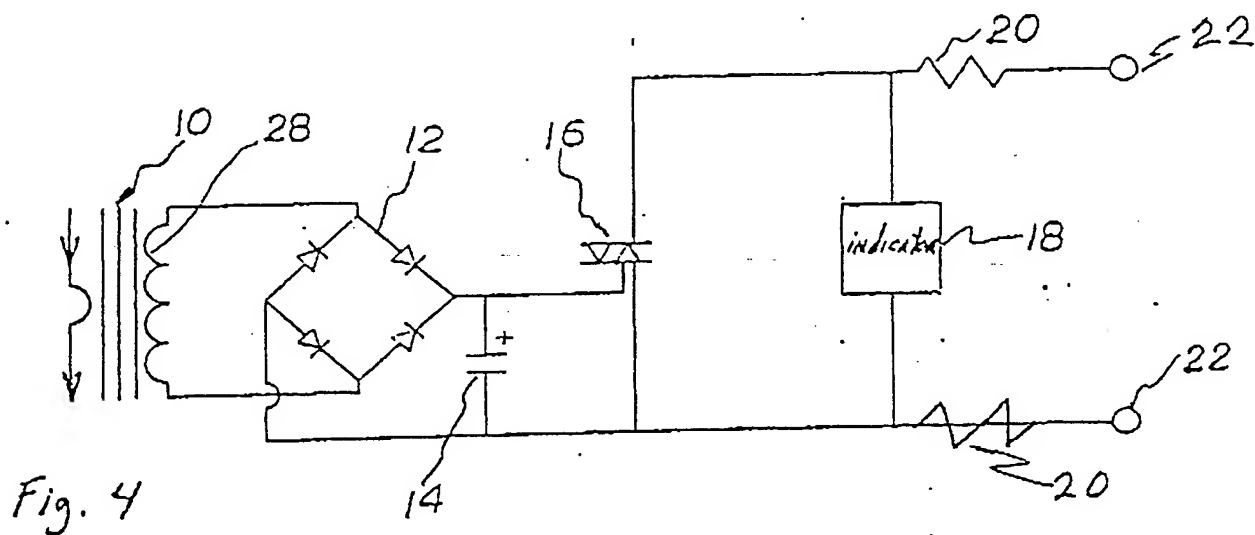


Fig. 4

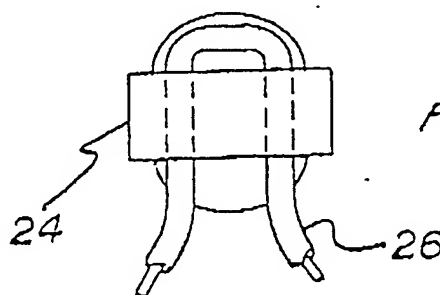


Fig. 5

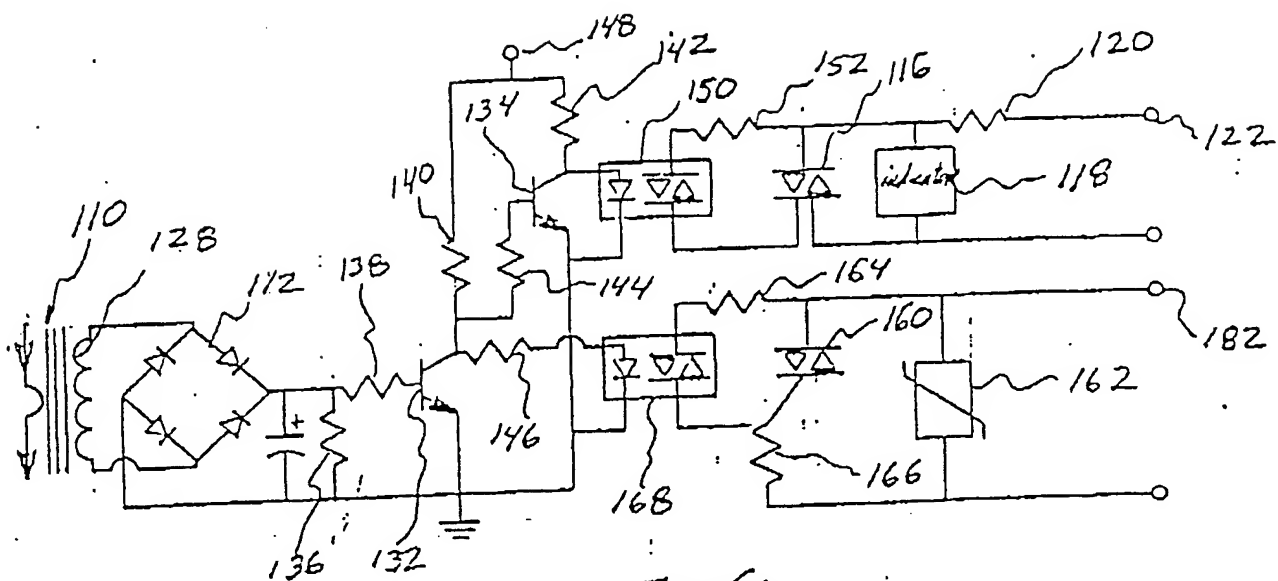


Fig. 6a.

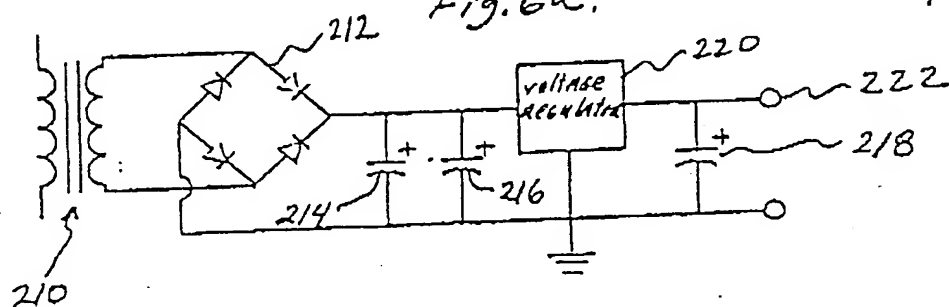


Fig. 6b

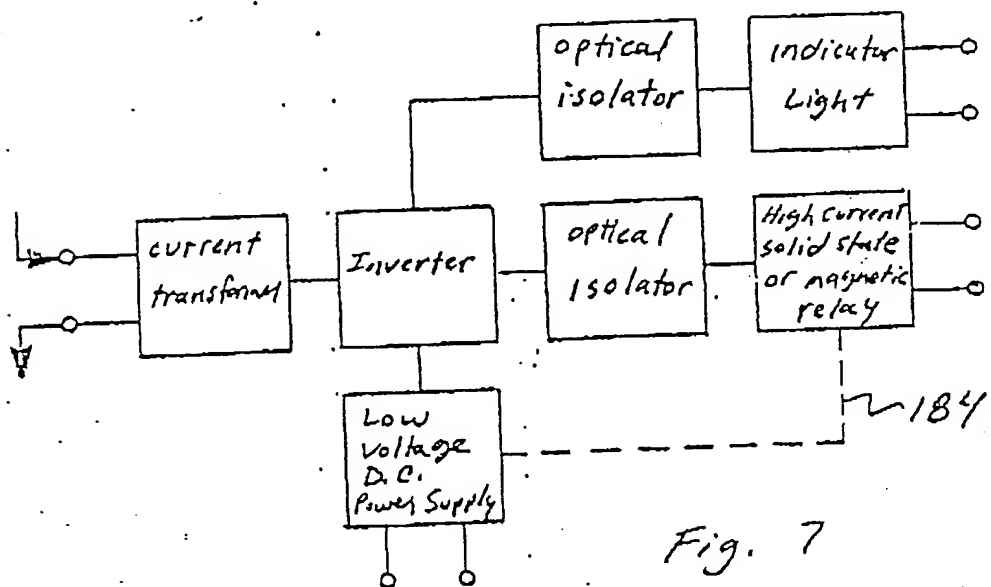


Fig. 7

Fig. 8

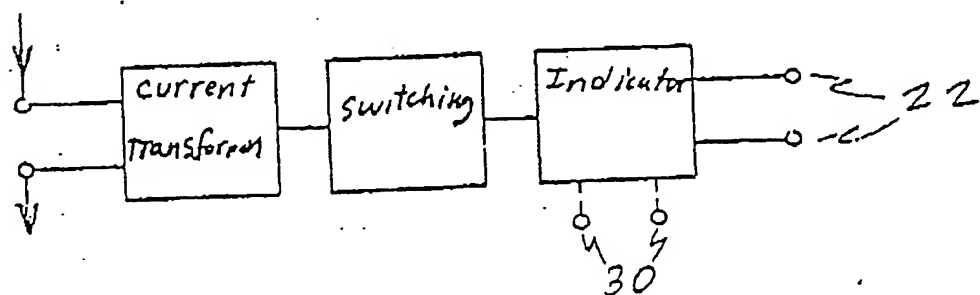


Fig. 13

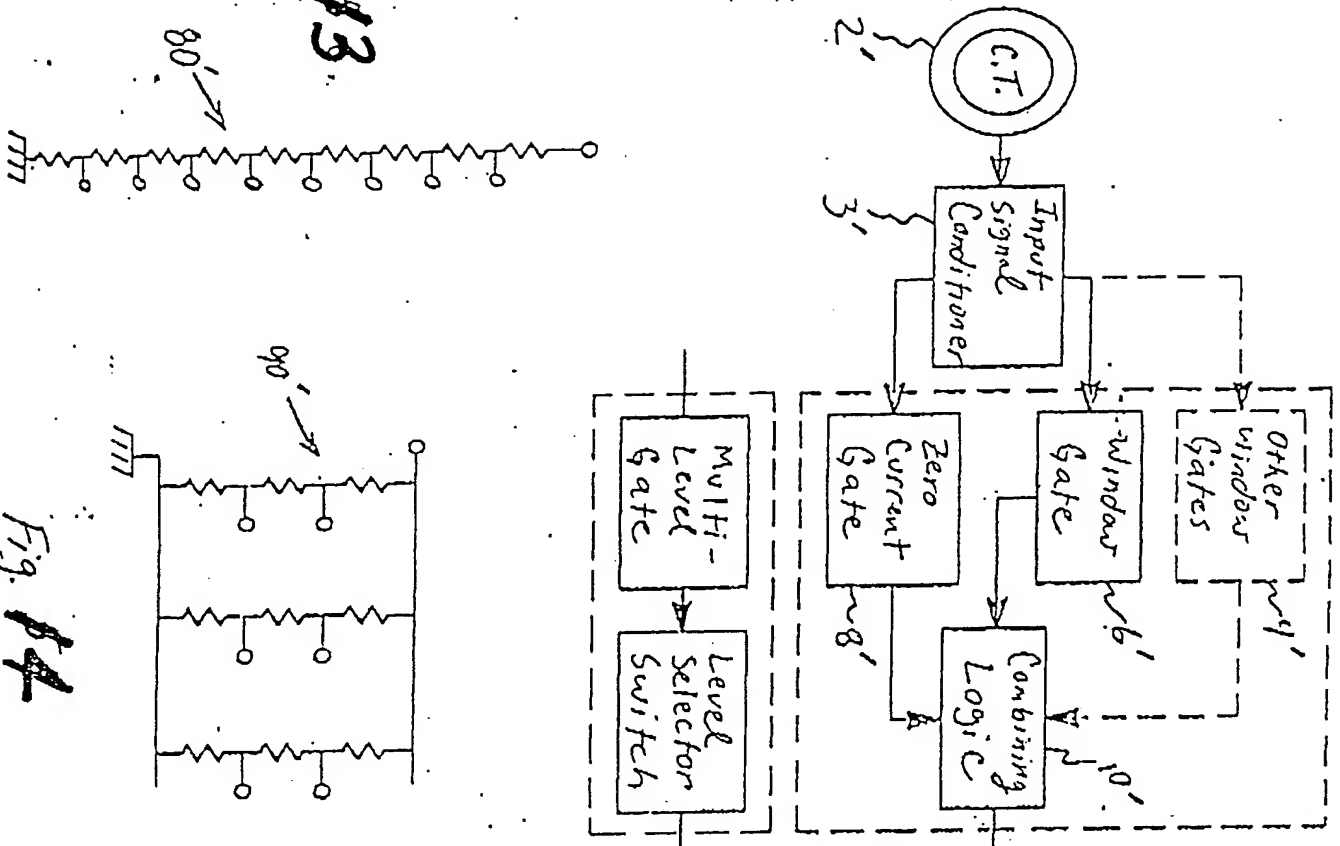


Fig. 14

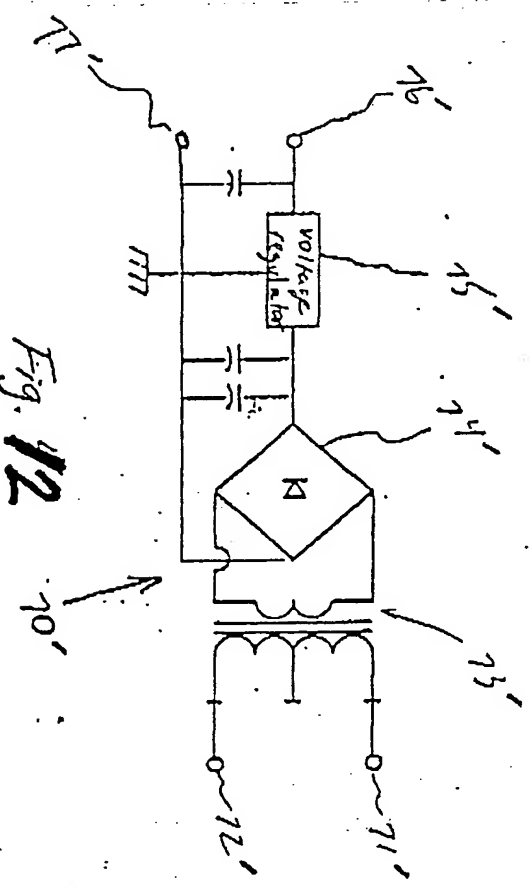


Fig. 12

Fig. 9

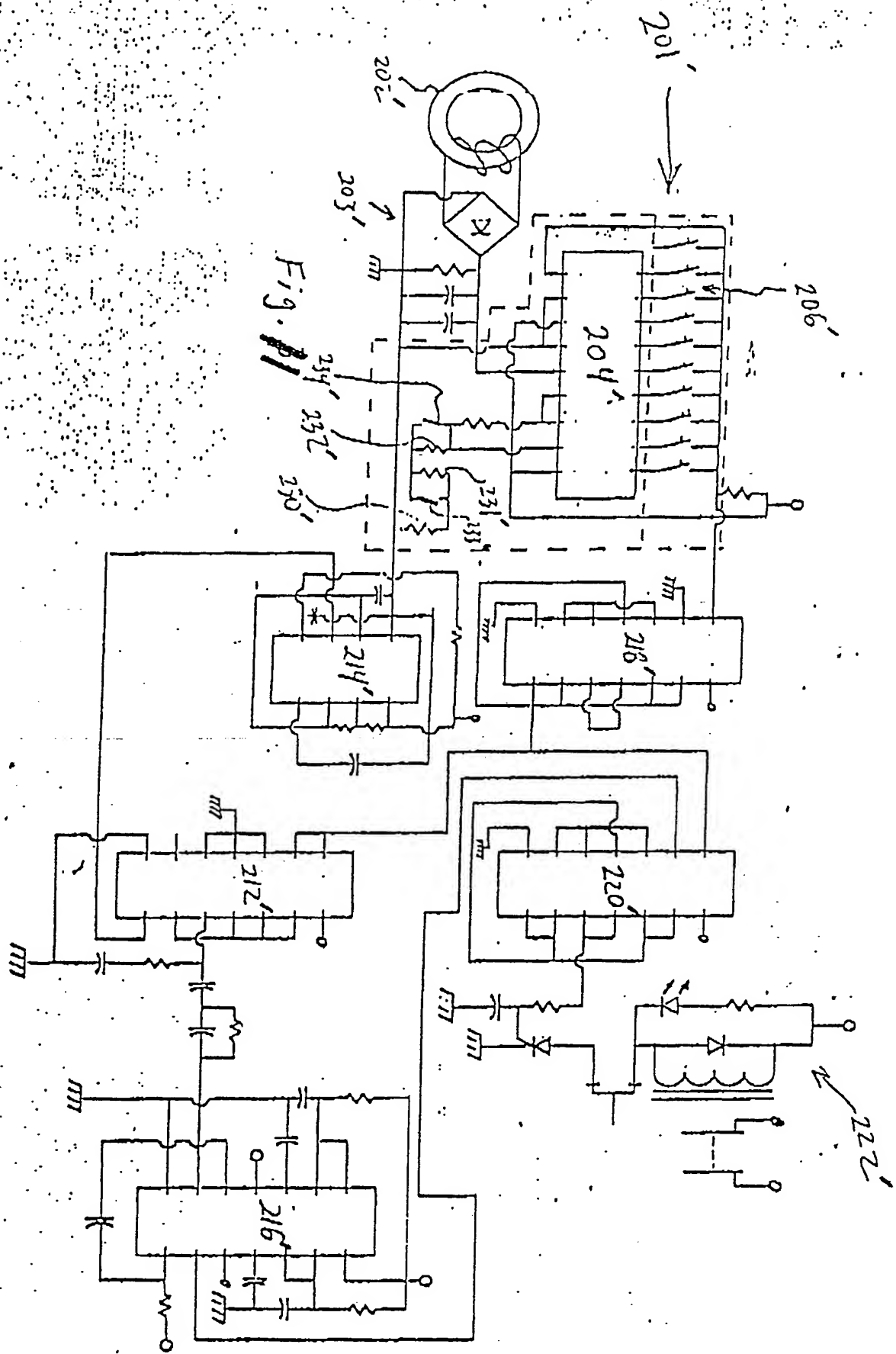


Fig. 1

(51) Int. Cl. : H01R

全 4 頁

(54)名 稱: 檢測一電氣裝置故障之裝置

(21)申請案號: 77107285

(22)申請日期: 中華民國77年(1988)10月20日

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(74)代理人: 鍾軼群 先生

1

[57]申請專利範圍:

2

1. 一種用以檢測電氣裝置故障之裝置, 包含:

- 一電流變壓器, 與電氣裝置串連;
- 一電流敏感開關裝置, 連接至該變壓器;

指示裝置, 連接至開關裝置; 及

一電源供應器; 及

當電氣裝置喪失電流時, 該開關裝置適於激發該指示裝置。

2. 一種以檢測電氣裝置故障之裝置, 包含:

一電流變壓器, 與電氣裝置串連;

反相裝置, 連接至該變壓器;

一電流敏感開關裝置, 連接至該反相裝置;

指示裝置, 連接至開關裝置; 及

至少一電源供應器;

該指示裝置包含第一及第二指示器;

及

當電氣裝置喪失電流時, 該開關裝置適於激發指示裝置。

3. 如申請專利範圍第1或2項所述之裝置, 其中:

該變壓器之初級圈與該電氣裝置串連

4. 用以檢測一組電氣裝置中單個電氣裝置之故障之裝置, 包含:

感應裝置, 連接至一組電氣裝置, 並

5. 提供與該組之電能相當之一輸入信號;

比較裝置, 連接至該感應裝置, 以接收該輸入信號, 並當至少設等裝置之一故障時, 提供一故障信號;

檢波裝置, 連接至此比較裝置, 並接收該故障信號;

定時裝置, 連接至比較及檢波裝置, 並於收到故障信號時受激發, 並在一預定時間後提供一定時信號至檢波裝置; 及

指示裝置, 連接至檢波裝置, 並自其中接收一激發信號;

該檢波裝置僅如同時收到故障及定時信號時, 方適於提供該激發信號至指示裝置。

5. 如申請專利範圍第4項所述之裝置, 其中:

該感應裝置連接至該電氣裝置之公共輸出端。

6. 如申請專利範圍第4項所述之裝置, 其中

該比較裝置包含一多位準開及一位準選擇開關；

該開關將輸入信號分為多個階層輸出，各輸出與不同之電能位準相關；及

該開關使該等階層輸出之任一一個可被選擇連接至檢波及定時裝置。

7. 一種用以檢測電氣裝置故障之裝置，包含：

感應裝置，連接至一電氣裝置，並提供與該裝置中之電能相當之一輸入信號；

比較裝置，連接至該感應裝置，以接收該輸入信號，用以比較輸入信號之值及一預定參考值，並當輸入信號值低於參考值時，輸出一故障信號；及

該比較裝置含有調整裝置，調整裝置可設於多個位置上，使該裝置適於選擇監測平常工作於不同電能位準上之不同電氣裝置。

8. 一種用以檢測電氣裝置故障之裝置，包含：

感應裝置，連接至一電氣裝置，並提供一輸入信號，該信號指示該裝置中之電能；

開關裝置，連接至該感應裝置，並接收其中之輸入信號；

一電源供應器，連接至該開關裝置；及

指示裝置，連接於開關裝置及電源供應器之間；

當該裝置中之電能大於或等於一預定位準時，該開關裝置適於接通，並防止指示裝置由電源供應器激發；及當該裝置中之電能低於該預定位準時，該開關裝置適於關斷，並容許指示裝置由電源供應器激發。

9. 一種用檢測電氣裝置故障之裝置，包含：

感應裝置，連接至一電氣裝置，並提

供一輸入信號，該信號指示該裝置中之電能；

反相裝置，連接至感應裝置，並接收其中之該輸入信號；

5. 開關裝置，連接至反相裝置；

電源供應器，連接至反相裝置及開關裝置；及

指示裝置，連接於開關裝置及電源供應器之間；

10. 當該裝置中之電能大於或等於一預定位準時，該開關裝置適於接通，並防止指示裝置由電源供應器激發；及當該裝置中之電能低於該預定位準時，該開關裝置適於關斷，並容許指示裝置由電源供應器激發。

15.

圖示簡單說明：

第 1 - 3 圖顯示裝備有本發明之指示燈及檢測裝置之電源電容器組件。

20. 第 4 圖為檢測裝置之第一實施例之電路圖。

第 5 圖為檢測裝置之感測環部份之放大圖。

第 6 a 圖為檢測裝置之第二實施例之電路圖。

25. 第 6 b 圖為第 6 a 圖電路之電源供應之電路圖。

第 7 圖為第 6 a 及 6 b 圖電路之方塊圖。

第 8 圖為第 4 圖所示電路之方塊圖。

30. 第 9 圖為第 10 圖實施例之方塊圖。

第 10 圖為檢測裝置之第三實施例之電路圖。

第 11 圖為檢測裝置之第四實施例之電路圖。

35. 第 12 圖為可用於第 10 或 11 圖中之電源供應器之電路圖。

第 13 及 14 圖為可用於第 10 圖中之不同電阻網路。



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FIG. 13

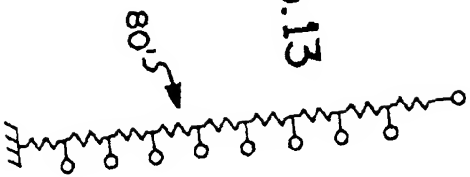


FIG. 14

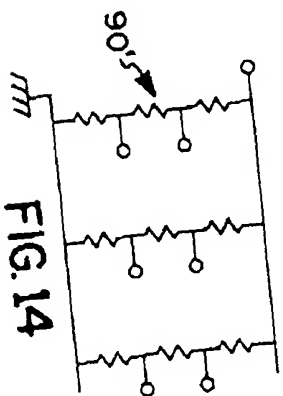


FIG. 12

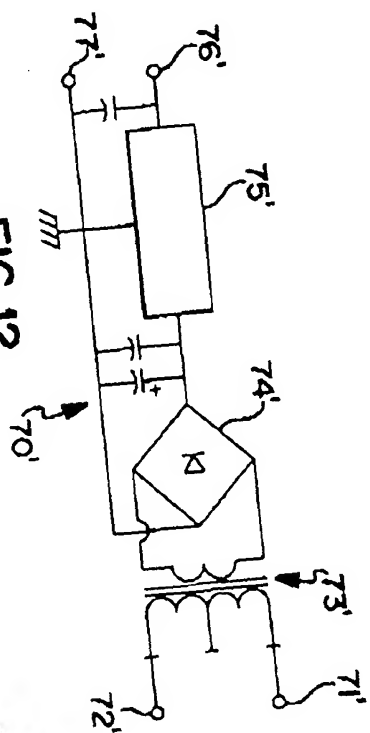


FIG. 9

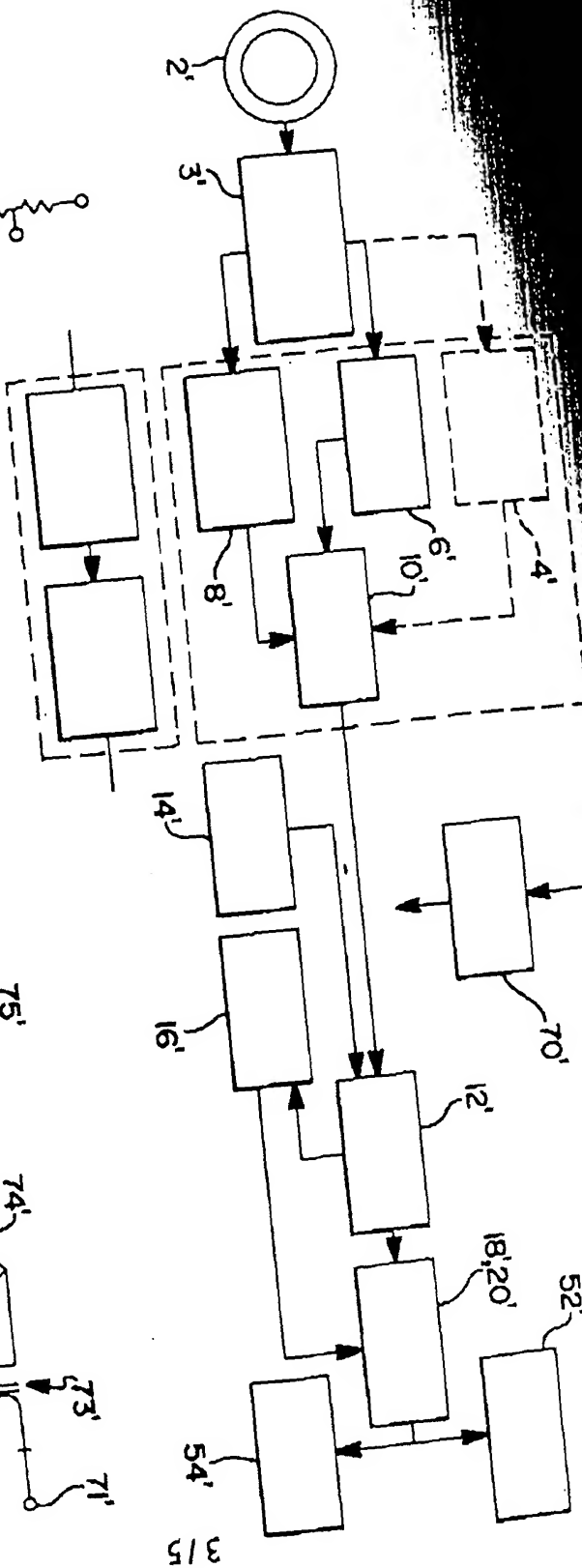
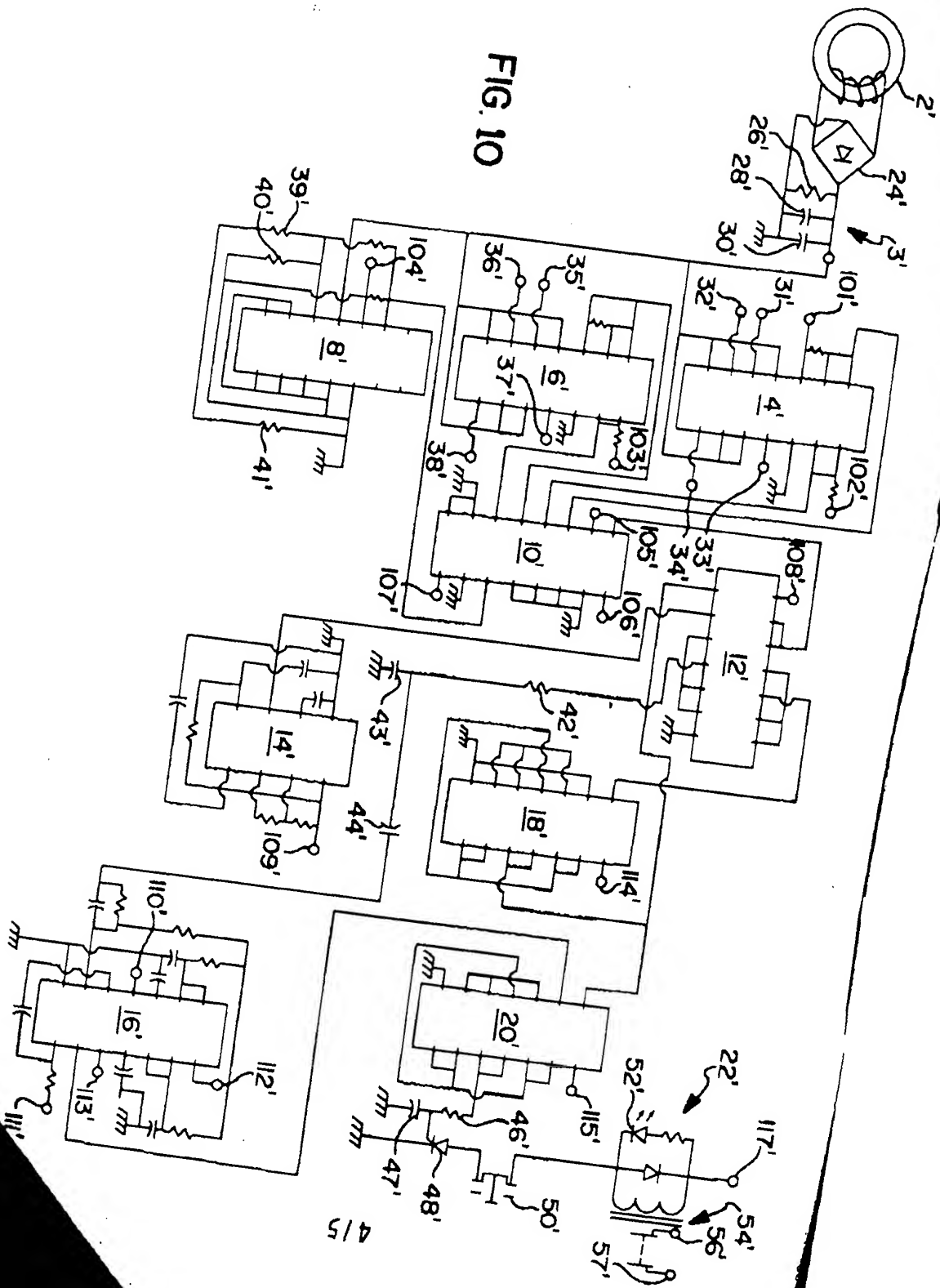


FIG. 10



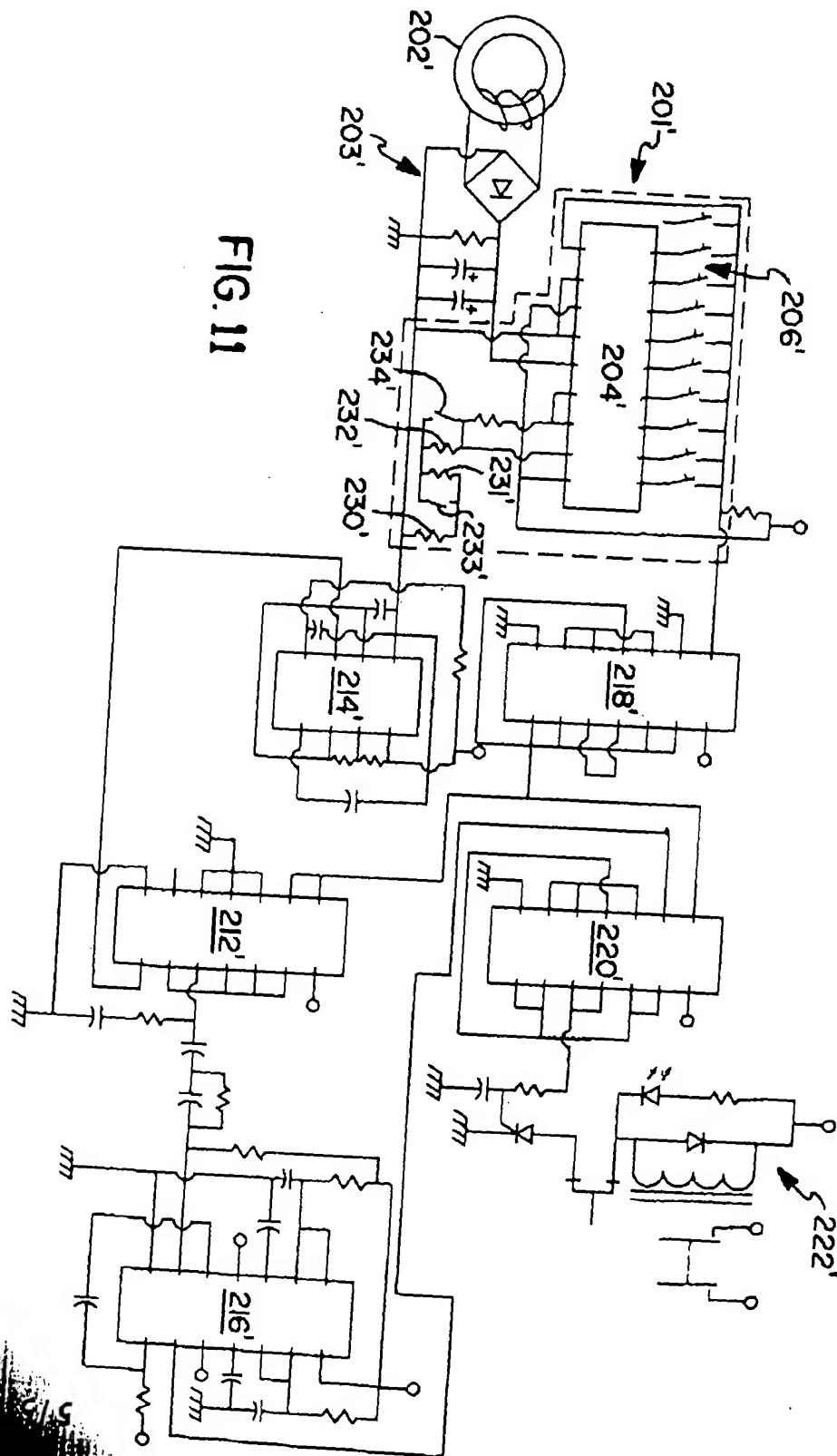


FIG. 11